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(54) **Security clamp for surgical device**

(57) A clamp for securing a joint between a tube, e.g. an infustion set, and a parenteral surgical device such as a catheter, comprises first locating means such as a resilient clip 2 for attaching to said tube, second locating means 7 for attaching to said surgical device, means e.g. in the form of telescopically slidable members 1, 4 for adjusting the separation of said first and second locating means to accommodate joints of different lengths, and means, e.g. a ratchet 3, for locking said adjustment.

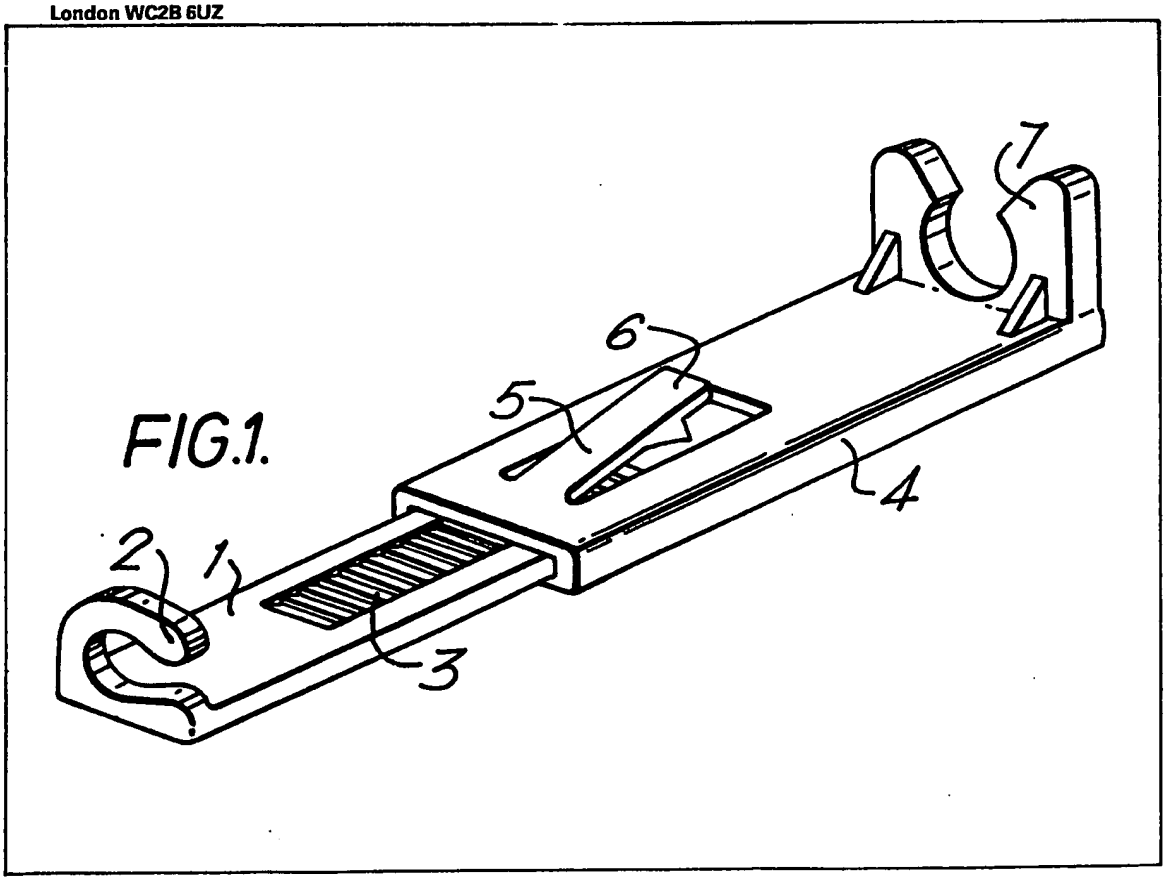

FIG.1.

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FIG.2.

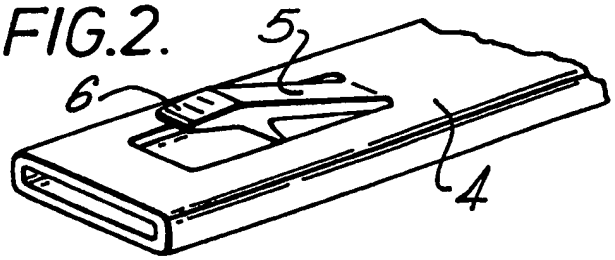


FIG.1.

FIG.3.

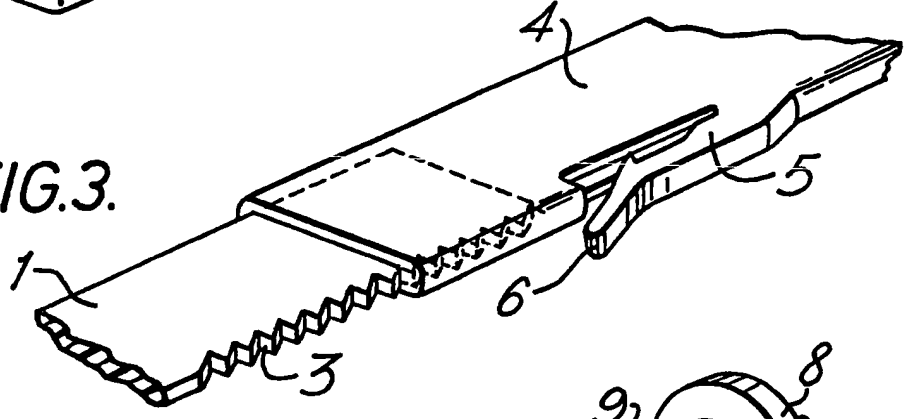


FIG.4.

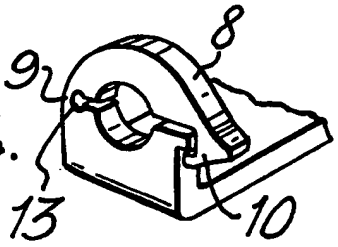


FIG.5.

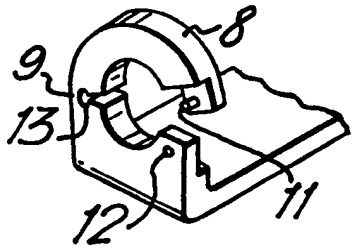
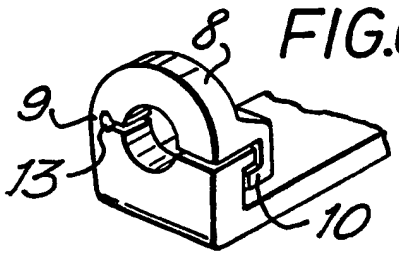


FIG.6.



SPECIFICATION

Security clamp for parenteral surgical device

This invention is concerned with a security clamp for securing the joint between a tube, such as an infusion set, and a parenteral surgical device such as a catheter.

Accidental disconnection of an infusion set or the like from an indwelling surgical device is a serious problem. Not only may the supply of an important medicament to the patient be interrupted but there is the possibility of air entering the vascular system and casuing embolism, which may be fatal to the patient. Such cases are frequently reported in the medical literature.

Disconnection can occur for a variety of reasons but is mainly due to defective mating of the two members forming the joint. Defective mating may be caused by incorrect tapers of the male and female portions, incorrect materials or defects in the materials or incompetent assembly of the joint by the nurse. Even if a sound joint is originally made, movement of the equipment or the patient may result in disconnection. These is always a risk that such disconnection will occur, and will be overlooked until serious consequences are evident.

This problem has been met to some extent by providing joints with integral locking means, such as the luer lock and record lock. However, it is still possible for the locking collar on such a joint to be turned without correct mating being ensured; a joint may, for instance, still leak if the male and female tapers are not correctly matched. Alternatively the locking collar may be loosely turned or may subsequently work loose as a result of movement by the patient. Thus there is still a need for a way of preventing such accidental disconnection.

In one aspect our invention provides a clamp for securing a joint between a tube, e.g. an infusion set, and a parenteral surgical device such as a catheter, said clamp comprising first locating means for attaching to said tube, second locating means for attaching to said surgical device, means for adjusting the separation of said first and second locating means to accomodate joints of different lengths, and means for locking said adjustment.

Said first and/or second locating means may be in the form of a resilient clip into which the tube or surgical device may be sprung. Preferably the clamp is so designed that said surgical device may be inserted into said second locating means by movement of the clamp along the body surface of the patient and substantially without causing movement of an indwelling surgical device.

For even greater security, the first and/or second locating means may be in the form of a housing having a hinged or detachable closure member to prevent accidental removal of the tube or surgical device from its respective locating means. The closure member may be provided with securing means which preferably are resiliently engageable.

The means for adjusting the separation of said first and second locating means preferably comprises telescopically slidable members, for example a bar sliding in a flattened tube. The clamp comprises means for locking the adjustment and preferably these means operate automatically so that the locking cannot be overlooked. Exemplary automatic locking means comprise a ratchet, e.g. comprising a rack on the inner telescopic member engaging with a pawl on the outer telescopic member. Alternatively a screw adjustment provides a simple automatic locking means.

The clamp according to the invention may be fabricated from any suitable material such as metal or plastics. A metal clamp may be sterilised and reused, but in general it is preferable to form the clamp from plastics material, in which case it may be treated as disposable. Suitable plastics materials include, for example, rigid PVC, polypropylene and acrylic copolymers.

The invention will be further described by way of example only with reference to the acompanying drawings wherein:–

Figure 1 is a perspective view of a clamp according to the invention;

Figure 2 is a partial view of an alternative ratchet arrangement for use in the clamp of Figure 1;

Figure 3 is a partial perspective view of yet another ratchet arrangement for the clamp of Figure 1; and

Figures 4-6 are perspective views of three different locating means suitable for placement at one or both ends of the clamp of Figure 1.

Referring now to Figure 1, a bar 1 is provided with a resilient clip 2 suitably dimensioned to engage the hub of a catheter or like parenteral device. The bar 1 also comprises a ratchet rack 3. The bar 1 is telescopically slidable within a flattened tubular member 4 having an integral pawl 5 comprising a release tab 6. The member 4 also bears a locating means 7 into which the tube of an infusion set or the like may be clipped.

The clamp is thus comprised of only two parts. In use of the device, the hub of the catheter is snapped into the clip 2 without disturbing the positioning of the device in the patient. The tube leading from the infusion set is then snapped into clip 7 and the members 1 and 4 are telescoped together until a firm clamping action is obtained. The clamp is automatically locked by the ratchet 3 and pawl 5, and can only be released by a lifting motion on tab 6.

Thus once the device is in place the joint between the infusion set and the catheter is effectively protected from accidental disconnection.

In Figure 2 the pawl 5 extends in the opposite direction but otherwise functions as in Figure 1.

In Figure 3 the rack 3 is formed on one edge of the bar member 1 and the pawl 5 is correspondingly positioned on an edge of the tubular member 4. It requires an outward movement of tab 6 to disengage the pawl and release the clamp.

In Figures 4, 5 and 6 the locating means 2 for the catheter hub or the like is formed as a housing having a closure member 8 which may be opened (Fig-

ure 5) on a hinge 9 to admit the catheter hub. The member 8 may then be snapped shut and retained in the closed position by a claw 10 (Figures 4 and 6) or a pin 11 engaging with a bore 12 (Figure 5).

The bore 13 is so positioned and dimesioned that the remaining web 9 serves as a hinge.

All the above embodiments are moulded in thermo-plastics material such as polypropylene. Each clamp may be sealed in plastics foil and sterilised by any suitable process such as X-radiation.

CLAIMS

1. A clamp for securing a joint between a tube and a parenteral surgical device, said clamp comprising a first locating means for attaching to said tube, second locating means for attaching to said surgical device, means for adjusting the separation of said first and second locating means to accommodate joints of different lengths, and means for locking said adjustment.

2. A clamp as claimed in claim 1 wherein said first and/or second locating means is in the form of a resilient clip into which the tube or surgical device may be sprung.

3. A clamp as claimed in claim 1 wherein said first and/or second locating means is in the form of a housing having a hinged or detachable closure member to prevent accidental removal of the tube or surgical device from its respective locating means.

4. A clamp as claimed in claim 3 wherein said closure member is provided with resiliently engageable securing means.

5. A clamp as claimed in any of the preceding claims wherein an indwelling surgical device may be inserted into said second locating means by movement of the clamp along the body surface of a patient, substantially without causing movement of said surgical device.

6. A clamp as claimed in any of the preceding claims wherein said means for adjusting the separation of said first and second locating means comprises telescopically slidable members having a ratchet locking means.

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